The importance of income elasticity of demand

Nigel Watson explains the significance of income elasticity of demand for business

Burgers are a normal good

Income is an important factor that affects demand. Income elasticity of demand measures the responsiveness of quantity demanded to a change in income. When incomes change, the demand curve shifts. In some cases an increase in income might cause the demand curve to move to the right. This is an increase in demand. However, for some products, an increase in income causes a decrease in demand. In this case, the demand curve moves to the left.

How is it calculated?

A product's income elasticity of demand tells us both the direction, and the magnitude, of a shift in demand caused by a 1% change in income. A numerical value for income elasticity of demand can be calculated using the following formula:

$$\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

In recent years, wages in China have risen rapidly. According to Tradingeconomics.com, over the last 20 years the average income earned by a Chinese worker increased by 747%, from £1,050 to £8,900. Over the same period, the demand for cars rose by 2,420%, from 1 million to 25.2 million vehicles per year. On the basis of these figures, the income elasticity of demand for cars in China is 2,420% ÷ 747% = 3.2

This indicates that for every 1% increase in income, the demand for cars in China increases by 3.2%.

What's happened in the UK?

According to the government, the UK economy is in good health. Gross domestic product (GDP), which is the monetary value of all goods and services produced by firms operating within the UK over the last year, continues to grow, and employment levels are at a record high.

Unfortunately, this statistical recovery claimed by politicians and economists has failed to create a feel-good factor, because for many UK households living standards are still a long way below what they were prior to the financial crisis of 2008–09. This is because wages have failed to grow at the speed needed to keep pace with the cost of living increases caused by inflation.

Economists and their friends in the media have repeatedly told households that UK inflation is low. This is true. However, even low rates of inflation compound over time, creating a substantial increase in the price level, and thus the cost of living.

Table 1 UK RPI 2008–17

Year	RPI (1987 = 100)
2008	214.8
2009	213.7
2010	223.6
2011	235.2
2012	242.7
2013	250.1
2014	256.0
2015	263.1
2016	263.1
2017	272.5

Source: ONS

Table 1 shows what has happened to the average UK price level over the last decade using the retail prices index (RPI), which is an official measure of inflation calculated by the Office for National Statistics (ONS).

By calculating the percentage change in the RPI during the period shown, we can see that the cost of living in Britain over the last decade has risen by 57.7 ÷ 214.8 = 26.9%

Unfortunately, most UK workers have not seen their pay grow by anywhere near 26.9%. According to Tradingeconomics.com, in 2008 the average weekly wage in the UK was £433. By June 2018 it had risen to £515 per week, which is an increase of 18.9%. Therefore, in real terms, the average household experienced a cut in wages of 8%.

Impacts on spending

This is confirmed by Figure 1, which also shows that private sector real-wage growth slowed more severely in the lead up to and after the economic downturn, but that since 2013 the private sector has outpaced the public sector in terms of wage growth. Incidentally, it is also interesting to note that British real pay had been declining on and off for many years prior to the 2016 referendum on the UK's membership of the European Union — so it would be quite wrong to attribute falling real wages and declining British living standards solely to Brexit.

For many years, UK consumer spending held up remarkably well, despite falling real incomes. This was because some households decided to maintain their spending by running down their savings. Others took advantage of low interest rates and used cheap credit to keep on shopping. Both approaches were always doomed to fail in the long run:

- Savings can't be relied upon forever to keep demand up, because money saved can only be spent once.
- Credit-fuelled consumption using loans and credit cards isn't sustainable because borrowing to consume increases the borrower's debts without increasing the borrower's income. As time goes on, households will have to pay more and more interest to the bank every month as their debts rise, leaving less left over for consumption.

In 2018, UK household debt levels are back up to levels last seen before the 2008–09 financial crisis. Furthermore, a growing number of households now appear to have hit a debt saturation point. Put simply, this means that many can't cope with the debts that they already have, and are therefore becoming increasingly reluctant to add to their debts by spending borrowed money.

Household savings are all but exhausted too, and according to the Bank of England, household saving is now at an all-time low. Given these statistics, the 3.1% fall in UK high street spending that occurred in April 2018 is unsurprising. It will almost certainly continue. In the long term, consumption must fall back to a level that can be financed from income. The long term now looks like it has arrived. The decade-long squeeze on real incomes is finally starting to cause havoc in the retailing and restaurant sectors of the UK economy.

Business impacts

So what are the business impacts of falling real incomes? In response to the falls in spending, a number of UK retailers and restaurants, including Jamie's Italian, Byron Hamburgers, Mothercare and Toys R Us, have been forced to close branches or even shut down altogether. However, other businesses have announced increases in both sales and profits.

It is important to recognise that falling income will affect different firms in different ways according to the income elasticity of demand of their product range. There are three types of product that are affected by income elasticity of demand:

- normal goods
- luxury goods
- inferior goods

Normal goods

Normal goods have a positive income elasticity value that is below 1. The positive value indicates that there is a positive

Practice exam question

Analyse two factors of income elasticity. (10 marks)

BusinessReviewExtras

Check your answer at www.hoddereducation.co.uk/businessreviewextras

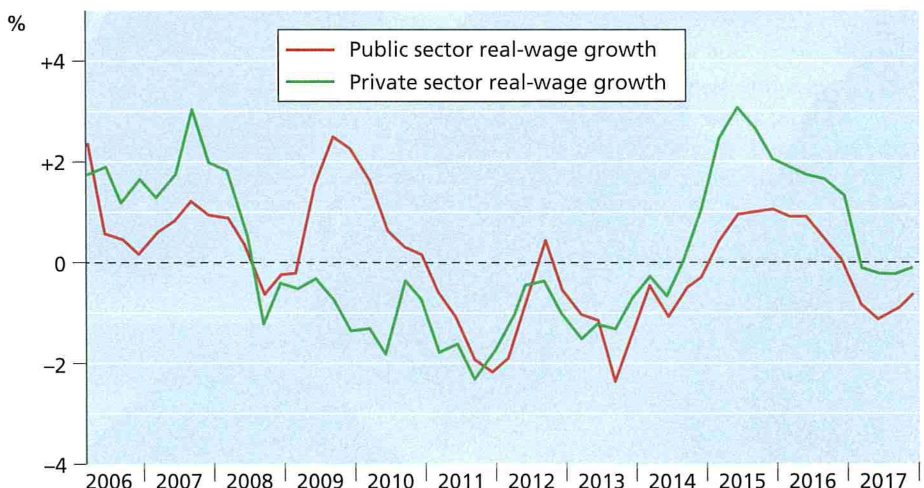

Figure 1 UK public and private sector real-wage growth 2006–18

correlation between income and quantity demanded. In other words, when incomes rise, the demand for a normal good will increase too. The opposite is true when incomes fall. However, because normal goods have an income elasticity value of less than 1, the change in demand created by an income change will be less than proportionate.

Let's assume that the income elasticity of demand for the burgers sold by the fast-food chain Byron is +0.2. Real incomes are currently falling across the UK. What will an income elasticity figure of +0.2 mean for the demand for Byron's products?

The answer is straightforward. A 5% fall in income would only cause a 1% fall in demand for Byron's burgers. In Figure 2, the decrease in demand from D1 to D2 causes marginal falls in both price (P1 to P2) and the equilibrium quantity (Q1 to Q2). Total revenue is equal to price multiplied by quantity. As a result of the decrease in demand, the total revenue received by Byron will decrease slightly, from P1 × Q1 to P2 × Q2.

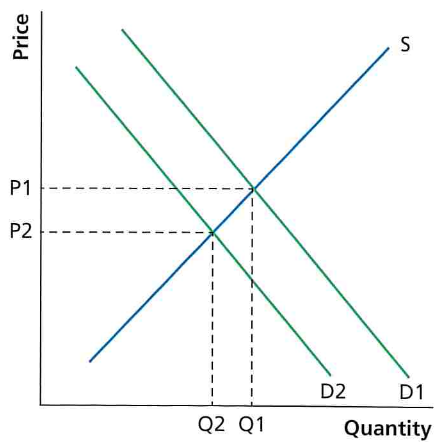

Figure 2 Demand for normal goods

In recent times, Byron has closed down some of its branches. This might be due to the fall in revenue created by declining consumer incomes. Rather than eating out, households might be opting to eat home-cooked food instead.

Luxury goods

Luxury goods also have a positive income elasticity of demand. However, unlike a normal good, the income elasticity value is above 1. This means that an income change creates a more than proportionate change in quantity demanded. The demand for luxury goods is therefore far more sensitive to changes in income than the demand for normal goods.

New cars are a classic example of a luxury good, and sales of new cars are particularly susceptible to changes in income. During a recession, new car sales fall sharply. This is because it is relatively easy to postpone buying a new car when money is tight by opting to repair the car you already have. According to Figure 1, in 2017 real wages in the UK fell by approximately 1% and 0.2% in the public and private sectors respectively. In total, across both sectors, this equates to a 0.6% fall in UK real wages. In the same year, new cars sales in Britain fell by 5.5%. These figures imply that the income elasticity of demand for new cars in Britain is 5.5% ÷ −0.6% = +9.2

If this income elasticity figure is correct, a 5% fall in income in the UK would create a 46% (−5% ÷ +9.2 = −46%) decrease in the demand for new cars. When incomes fall, the demand for luxury goods will fall by more than the demand for normal goods (Figure 3). Notice that the decrease in demand caused by the same 5% fall in income is much greater for luxury goods (D1 to D3) than it was for normal goods (D1 to D2). The decrease in total revenue created will also be much greater. This is because the falls in both price and quantity that are caused by the decrease in demand are also greater.

New cars are a classic example of a luxury good

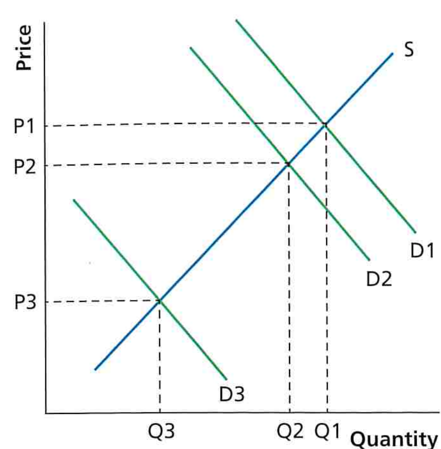

Figure 3 Demand for luxury goods

Inferior goods

Inferior goods are not necessarily poor-quality products. In this context, the word 'inferior' simply means that the product in question has a negative income elasticity of demand. This means that when incomes fall, the demand for inferior goods will increase. A classic example of an inferior good is the demand for groceries sold by Aldi and Lidl. Both companies have managed to gain customers at a time when real incomes have been falling in the UK. This is due to trading-down — a phenomenon where consumers react to falling incomes by switching from a more expensive brand to a cheaper one.

This means that unlike normal and luxury goods, a fall in income will increase the demand for an inferior good, shifting the demand curve to the right from D1 to D4 (Figure 4). Other things being equal, this will lead to an increase in price of P1 to P4 and an increase in equilibrium quantity of Q1 to Q4. This combination of higher prices and higher sales will lift revenues from P1 × Q1 to P4 × Q4. Companies like Aldi and Lidl that sell inferior goods do well when incomes are falling.

Inferior goods are not necessarily poor-quality products

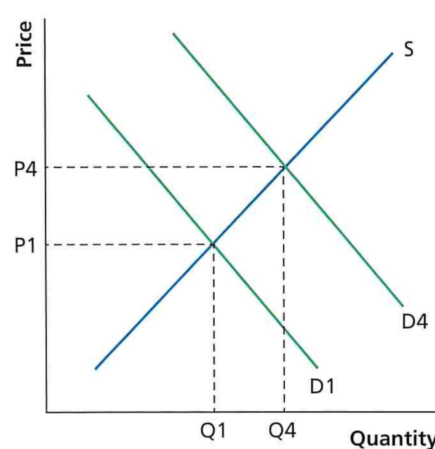

Figure 4 Demand for inferior goods

Evaluation

Income is one of many factors that affect demand. Therefore, we should exercise extreme caution when calculating and interpreting income elasticity of demand figures. For example, in 2017 Lidl experienced a 16% increase in sales. Some of this increase was undoubtedly due to falling incomes. However, it would be foolish to attribute all of this increase in sales to a trading-down effect. Other factors were almost certainly at work, including a growing reputation for selling high-quality products — in blind tests, Lidl has won a number of prestigious industry awards in a number of different product categories, including fine wine. Also, some of the decline in high street spending that we have seen in recent times is due to consumer preference for online shopping.

Household income is a macroeconomic external factor that is beyond the control of a firm. Falling incomes will make life tough for UK producers of luxury goods. However, this does not mean that all luxury goods producers will experience a decrease in demand when incomes drop. An important aspect of a manager's job is to make compensating changes to internalise external constraints. In the case of a car manufacturer, like Jaguar Land Rover, falling UK sales caused by falling household incomes could be more than offset by an export drive to China, a country where incomes are growing rapidly.

Further reading

'China car sales analysis February 2018', Carsalesbase.com, **www.tinyurl.com/yctrtd8t**

'Fitch warns of UK consumer debt bubble', *The Week*, **www.tinyurl.com/ybsarkg3**

'UK retailers suffer sharpest sales drop for 22 years', *Guardian*, **www.tinyurl.com/y9y37krw**

'Lidl ranked among the best wines in the world', *Business Insider*, **www.tinyurl.com/ybzrrz2c**

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